

What is claimed is:

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1. An orbital abrading machine comprising:
 - a housing;
 - a motor supported by said housing and having an output driven for rotation about a first axis;
 - a pad for use in abrading a work surface;
 - coupling means for coupling said pad to said output for movement along an orbital path of travel about said axis; and
 - counterbalance means for dampening vibration of said machine while said pad is engaged with said work surface to a greater degree than when said pad is not engaged with said work surface.
2. A machine according to claim 1, wherein said pad is supported for rotation about a second axis disposed parallel to said first axis and arranged for movement along said orbital path.
3. A machine according to claim 1, wherein said coupling means includes an assembly having a head portion driven for rotation about said first axis and defining a mounting recess having a second axis; bearing means supported within said mounting recess; and connecting means for connecting said pad to said bearing means for rotation about said second axis; and said counterbalance means is operable to substantially counterbalance said pad, said bearing means, said connecting means and any portion of said head portion not concentric to said first axis and substantially counterbalance a drag force acting on said pad when engaged with said work surface.
4. A machine according to claim 3, wherein said

counterbalance means includes at least first and second masses carried by said head portion to project radially of said second axis.

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5. A machine according to claim 4, wherein said first and second axes lie within a plane and said first and second masses are not bisected by said plane.

6. A random orbital abrading machine comprising:
a manually manipulatable housing;
a motor supported by said housing and having an output driven for rotation about a first axis;
a pad for use in abrading a work surface; and
an assembly for coupling said output to said pad for application to said work surface and mounting said pad for free rotational movement about a second axis adapted to orbit about said first axis, and said assembly includes counterbalance means for substantially counterbalancing said pad and portions of said assembly not disposed concentric to said first axis and for substantially counterbalancing a drag force acting on said pad only when engaged with said work surface.

7. A random orbital buffering machine comprising:
a housing;
a motor supported by said housing and coupled to a drive shaft driven for rotation about a first axis;
a pad for use in buffering a work surface; and
an assembly for coupling said drive shaft to said pad for application to said work surface and mounted for free rotational movement about a second axis adapted to orbit about said first axis, and said assembly includes

means for dampening vibration due to a drag force acting on said pad when engaged with said work surface.

8. An assembly for connecting an abrasive pad to drive means of a random orbital abrading machine having a first axis of rotation, whereby to support said pad for free rotational movement about a second axis of rotation disposed parallel to said first axis, as said second axis is caused to orbit about said first axis, said assembly comprising:

a head portion adapted for connection with said drive means for rotation therewith about said first axis and defining a mounting recess;

bearing means supported within said mounting recess and defining said second axis;

means for connecting said pad to said bearing means for rotation about said second axis; and

counterbalance means for at least substantially counterbalancing said pad and portions of said assembly not disposed concentrically of said first axis and for at least substantially counterbalancing forces to which said pad is exposed during use as a result of engaging a work surface.

9. An assembly according to claim 7, wherein said first and second counterbalance means include first and second masses carried by said head portion to project in generally opposite directions radially of said second axis, and said first and second masses being arranged such that they are not bisected by said plane.

10. A portable orbital abrading machine comprising:

a manually manipulatable housing;

a motor supported by said housing;
an orbital assembly coupled to said motor for driven rotation about a first axis of rotation and adapted to support a work piece engaging abrasive pad for orbital movement about first axis; and

counterbalance means for counterbalancing at least a substantial portion of a drag force acting on said pad as a result of abrading engagement thereof with said work surface during use of said machine under work conditions producing a predetermined torque opposing driven rotation of said assembly about said axis.

11. A machine according to claim 10, wherein said counterbalance means is carried by said assembly.

12. A machine according to claim 11, wherein said assembly is directly coupled to said motor by a drive shaft of said motor.

13. In a portable random orbital abrasive machine having a motor supported within a manually-manipulated housing and coupled to an assembly supported for rotation about a first rotational axis and adapted to support a work surface engaging abrasive pad for free rotation about a second rotational axis which is arranged parallel to said first axis and orbits thereabout, the improvement comprising in combination:

means for counterbalancing at least a substantial portion of a weight of said pad and portions of said assembly not disposed concentric to said first rotational shaft and for counterbalancing at least a substantial portion of a drag force acting on said pad as a result of abrading engagement thereof with said work surface during

use of said machine under work conditions producing a predetermined torque opposing driven rotation of said assembly about said first axis.

14. The improvement according to Claim 13, wherein said first and second axes lie within a plane, and said counterbalance means includes at least first and second masses arranged to project radially of said second axis and arranged such that they are not bisected by said plane.

15. A machine according to claim 13, wherein said first and second axes lie within a plane, and said counterbalance means includes at least two masses arranged non-symmetrical relative to said plane.

16. In a portable orbital abrasive machine having a motor supported by a manually-manipulated housing and coupled to an assembly supported for rotation about an axis and adapted to support a work surface engaging abrasive pad for orbital movements about said axis, the improvement comprising in combination:

means for counterbalancing at least a substantial portion of a drag force acting on said pad as a result of abrading engagement thereof with said work surface during use of said machine under work conditions producing a predetermined torque opposing driven orbital movement of said pad.